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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/060,068 | 01/29/2002 | Ubaldo Mastromatteo | 854063.670 | 8416 |

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EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

JK

| | | | |
|------------------------------|------------------------|----------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/060,068 | MASTROMATTEO, UBALDO | |
| | Examiner | Art Unit | |
| | Steven H. Rao | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-20,27-33,35-40 and 55-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 13-20,27-33,35-40 and 55-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

Applicants' amendment filed on March 06, 2006 has been entered and forwarded to the examiner on March 15, 2006.

Therefore claims 13,16,18,27,38,55,56,57,60,and 65 as amended by the amendment and claims 14-15,17, 19-20, 28-33,35-40, 58-59, 61-64 and 66 as previously recited are currently pending in the Application.

Claims 1-12,21-26,34 and 41-54 were previously cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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Claims 13-16, 18, 27-29, 55-58, 60, 62 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Ko et al. (U.S. Patent No. 6,465,271, herein after Ko).

With respect to claims 13, 27, 55 Ko describes a device forming an electromechanical or optical micro system, the device comprising :a first body of semiconductor material (Ko fig. 1I "A") and a second body welded together through a mechanical and electrical connection structure, the mechanical and electrical connections structure (Ko fig. 1F) comprising: an electrically conductive region welded between said first body (Ko fig. 1 F col.11 lines 17-20, etc.) first body(wafer A) and said second body (wafer B) ; and a unitary spacer region arranged near said electrically conductive region and extending between first and second bodies (Ko fig. 1I # , 104, 114, 152C) the spacer region including a completely enclosed first cavity surrounding an active region of the electromechanical or optical micro system (defining an enclosed space between the first and second bodies) (or surrounding more than half of an active region, or at least two contiguous sides of an active region) (or surrounding at least three sides an active region) (Ko fig. 1L cavities wherein element 132, 130 or 131 are placed) .

With respect to claims 14 , 28 and 58 Ko describes the device according to claim 13, 27 and 55 wherein said electrically conductive region is of a low-melting eutectic material. (Ko col.11 lines 25-30,)

With respect to claims 16 and 60 Ko describes the device according to claim 13, 55 wherein said spacing region is of dielectric material. (Ko fig. 1E #114, 104 etc.).

With respect to claims 18 and 56 -57 Ko describes the device according to

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claim 13, 55 wherein said spacing region forms a completely enclosed second cavity surrounding said electrically conductive region. (Ko figures,etc.)

With respect to claim 29 Ko describes the device of claim 27 wherein the first and second metal regions and the connection structure are formed within the first cavity defined by the spacer . (Ko figures).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-61, 30 , 62 are rejected under 35 U.S. C. 103 over Ko (U.S Patent No. 6,465,271, herein after Ko as applied to claims 1, etc. above and further in view of Chao et al. (U.S. Patent No. 5,633,535, herein after Chao) .

With respect to claim 17 and 61 Ko describes the device according to claim 16, 55 .

Ko does not specifically describe wherein said dielectric material is chosen from among a spun polymer, such as SUB, polyimide, a composite material formed by laminated polymer layers, such as a photosensitive stick foil, and oxynitrides.

However Chao, a patent from the same field of endeavor describes col. 66-67, etc, wherein said dielectric material is chosen from among a spun polymer, such as

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SUB, polyimide, a composite material formed by laminated polymer layers, such as a photosensitive stick foil, and oxynitrides to form dielectric that have required dielectric constant and other properties that are suitable for the processing steps of the sensor.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Chao's teachings in Ko' device . The motivation to make the above combination is to form dielectric that have required dielectric constant and other properties that are suitable for the processing steps of the sensor

With respect to claim 30 describes the device of claim 27 wherein the spacer further defines a completely enclosed second cavity between the first and second bodies , the device further comprising a micromechanical structure formed within the second cavity defined by the spacer . (Chao figures 4 A and B, 6 etc. different bodies defined by different spacers 40 , pad of substrate having printed circuit board).

Claim 62 wherein the active region comprises a 'suspended electro mechanical structure (Chao figures).

Claim 65 wherein the device of claim 55 further comprises a third body welded to the first body and adjacent to the second body, and spacer region extending between the first and third bodies and including a completely enclosed second cavity that surrounds an additional active region of the microsystem (Ko figures and Chao figures 4 etc.). having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

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With respect to claims 15 and 59 describes the device according to claim 14, 58 wherein said low-melting eutectic material is formed by alternating layers of gold and tin. (AU , tin well known eutectic materials)

Claims 19-20 and 31, 59, 63-64 and 66 are rejected under 35 U.S. C. 103 over Ko (USP 6,465, 271) and Chao et al. (U.S. Patent No. 5,633,535, herein after Chao) further in view of Yew et al. (U.S. Patent No. 6, 137.164, herein after Yew).

With respect to claim 19, Chao describes the device according to claim 13.

Chao does not specifically describe the device comprising a metal region which extends on top of said second body and beneath said electrically conductive region.

However Yew in figures 5,8 etc. describes metal regions extending on top of second body and beneath the electrically conductive region to form interconnections to perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Yew's metal regions extending on top of second body and beneath the electrically conductive region in Chao's device So form interconnections to the perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding. (yew col. 4 lines 8 to 15)..

With respect to claim 20,59 describes the device according to claim 19, wherein said welding region and said metal region are of a material chosen from among titanium, gold and nickel. (well known in the art).

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With respect to claim 31 describes the device of claim 27 wherein the first body of semiconductor material is formed of quartz. (well known in the art).

B. Claims 32-33, 35-38, 39-40, are rejected under 35 U.S. C. 103 over over Ko (USP 6,465, 271), Chao et al. (U.S. Patent No. 5,633,535, herein after Chao) and Yew et al. (U.S. Patent No. 6,1 37, 164,herein after Yew) as applied to the claims above and further in view of Duboz et al. (U.S. Patent No. 5,726, 500 herein after Duboz).

With respect to claim 32 Chao and Yew describe the device of claim 31 Chao and Yew do not specifically describe the device further comprising a mirror formed on a second surface of the first body.

However Duboz in col.4 lines 29-32, etc. describes the device further comprising a mirror formed on a second surface of the first body as pad of the photo sensitive element of the photodiode when the electronic circuit forma part of an infrared detector, etc.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Duboz's device including the mirror in Chao and Yew's device to form the photo sensitive element of the photodiode when the electronic circuit forma pad of an infrared detector, etc. (Duboz col. 4 lines 29-32, col. 5 lines 45-50).

With respect to claims 33 describes the device of claim 31, further comprising a diffractive lens formed on the second surface of the first body. (Duboz col. 5 lines 10-17) .

With respect to claims 33, 35-36, and 63 Chao describes the device of claim 31 wherein it comprises an electromechanical (Chao 42), fluid (Duboz col. 5 lines 10-17).

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and optical system (Duboz in col.4 lines 29-32).

With respect to claim 37, Chao describes the device of claim 36, further comprising a mirror formed on a surface of the first body opposite the optical structure. (Duboz col. 4 lines 29-32) .

With respect to Claim 38, Chao describes the device of claim 36 , further comprising a third body (Chao figures 4 5, third 42) welded to first body (welded to 10) adjacent to the second body (42 adjacent to second 42) and a spacing region formed between the first and third bodies and surrounding an additional active region. (figures 4 5) .

With respect to claim 39 the device of claim 38 further comprising first and second mirrors formed on opposite faces of the first body. (Duboz figure 5)

With respect to claims 40 and 66, Chao describes the device of claim 13, 55 wherein the first and second bodies are wafers of semiconductor material. (Duboz figure 110-GaAs, Is-silicon).

With respect to claims 63 and 64 wherein the light producing component is a LED (Duboz col. 5 line 49, etc.) .

Response to Arguments

Applicant's arguments with respect to claims 13 etc. have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire
within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

for
Steven Rao
Patent Examiner
May, 26, 2006

LONG PHAM
PRIMARY EXAMINER